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UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH ADMINISTRATION
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
Division of Forest Insect Investigations

NOT FOR PUBLICATION
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REPORT
of
FOREST PEST FUND ACTIVITIES
1949

By James C. Evenden
Division of Forest Insect Investigations

UNITED STATES DEPARTMENT OF JUSTICE
FEDERAL BUREAU OF INVESTIGATION
WASHINGTON, D. C. 20535
JANUARY 10, 1962

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REPORT
OF
SPECIAL AGENT IN CHARGE
JANUARY 10, 1962

TO : DIRECTOR, FBI
FROM : SAC, NEW YORK
SUBJECT: [illegible]

Agricultural Research Administration

Report of Forest Pest Fund Activities 1949

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INTRODUCTION

This is the first report of activities conducted by the Forest Insect Laboratory at Coeur d'Alene, Idaho, under the provisions of the National Forest Pest Act of 1947. This legislation has permitted steps to be taken to establish an accurate evaluation of forest damaging insects. It provides for programs of detection surveys to show the location and severity of potentially destructive outbreaks. It establishes procedures for the control of insect infestations and permits work to be done at a time when the greatest benefits will accrue. The activation of this law has become a forward step in programs of forest protection, and each year will be a more important factor in forest planning.

During the calendar year 1949 the Coeur d'Alene Laboratory carried a full program of forest insect detection and post control surveys. Technical assistance was also given by laboratory personnel to the administrative agency on a number of bark beetle control projects. The conduct of this program of surveys and technical service was handicapped somewhat by our inability to obtain additional trained leadership. As a result it was necessary to use various expediciencies in carrying this program. An officer experienced in bark beetle control and surveys, was detailed from the Forest Service to assume the administrative leadership of a large post control survey. A similar situation in a National Park was handled in a like manner through the detail of a Park Officer, and on one forest a post control survey was combined with a 5% timber cruise. On these survey projects the Coeur d'Alene Laboratory was responsible for the training of survey crew personnel as well as the planning and direction of the work. Two temporary employees, one a 1949 forestry graduate, and the other a former forest service employee were used as survey crew leaders. These men were given special training in survey procedures and techniques, and although they carried considerable responsibility, they were under direct supervision of our permanent personnel throughout the season.

Regardless of this handicap of trained leadership, our 1949 service program is considered as having been quite successful. We realize that there are improvements to be made in the administration of this program to obtain more efficient and effective results. We look forward to the development of an adequate program of detection surveys, so that, with an accepted degree of accuracy, we will know the status of insect conditions in all

timbered areas. The use of airplanes, aerial photography, improvements in the accuracy of ground surveys, maps, etc., present problems for which solutions will follow. We recognize the potentials of such developments and are constantly trying to bring them into an efficient and economic use.

FOREST INSECT CONTROL PROGRAMS AND SUBSEQUENT POST CONTROL SURVEYS

The administration of forest insect control is a function of the land managing agency involved. However, the technical phases of each operation are a responsibility of the Bureau of Entomology and Plant Quarantine. The details of this responsibility vary for different projects, but for the most part include the establishment of boundaries of areas to be treated, methods and techniques of treatments, training of treating and spotting personnel, and checking the character of the work performed. In addition to such technical duties, all possible assistance is given to the administrative agency in the planning and execution of the project. An assignment as a technical supervisor to a control operation demands an exacting and continuous performance on the part of the officer selected.

COEUR D'ALENE FOREST CONTROL PROJECT WESTERN WHITE PINE - MOUNTAIN BEETLE

In 1948 there was an infestation of 2700 white pine trees on the Yellow Dog-Downey Creek area of the Coeur d'Alene National Forest. In these units there are some 16,000 acres which supports a valuable white pine stand of 100,000 M.B.F. Unfortunately funds were not available for control.

During August and September 1949 these units were again covered by an intensive survey which was combined with a 5% timber cruise. Beetle and timber stand data were obtained from lines of 1/5 acre plots that girdled the area at 20 chain intervals. This work was performed by two man crews, with one man running compass, pacing, and mapping while the other obtained the plot data. The cost of this combined project was divided equally between timber management and post control survey funds.

During the past season there has been a marked increase in the severity of the 1949 infestation over that of the previous seasons. In these units there are now 12,410 infested trees and windfalls. This indicates an increase of 390 percent in the number of trees to be treated in May and June 1950. However this figure is an erroneous depiction of the increase in the beetle population but not in its potential destructiveness. Past studies have shown that only half as many beetles attack a white pine windfall as do a standing tree. However the year after attack the number of beetles that emerge from a windfall equals the number that emerge from a standing tree. As a result windfalls carry the same increase potential as standing trees, but an attacked windfall only represent approximately half as many attacking beetles. The 1949 infestation in this area was

recorded as 7,570 windfalls, and 4,840 standing trees. These figures indicate an insect population capable of attacking 8,625 standing trees or an increase of 219 percent instead of 390 percent indicated by the survey data. Control measures have been recommended for the control of this infestation.

CABINET FOREST CONTROL PROJECT
THOMPSON RIVER COOPERATIVE PROJECT
MOUNTAIN PINE BEETLE - LODGEPOLE PINE

In 1948 a representative of this laboratory made a field check of a reported group of infested lodgepole pine at the head of Cedar Creek, Cabinet National Forest, Montana. Although the reported trees were not relocated, a serious mountain pine beetle infestation within the lodgepole pine stands of the Thompson River Drainage was discovered. As this examination was late in the season, and as funds and personnel were limited, the subsequent survey was quite extensive although serving to establish the seriousness of the situation. The data obtained showed an infestation of 1/2 to 1 tree per acre, but did not establish the limits of the infested area. It is difficult to state when this outbreak started, but there was evidence of 1946 attacks in most areas. A large portion of the timber lands involved are privately owned.

A meeting of interested Federal, State, and private agencies was held in Missoula, on March 1, 1949. At this meeting it was forcefully stressed by representatives of this laboratory, that available data were not adequate to permit proper planning for control. To try and obtain such information the Anaconda Copper Mining Company underwrote the cost of an additional survey. This project, under the leadership of this laboratory, started on April 13, and was completed on the 29th. The additional data obtained indicated that there were from 15,000 to 20,000 infested trees, on some 35,000 acres. As this situation obviously warranted control a plan of action was recommended and adopted by the Federal Government and private timber companies involved. This plan called for the cost of control, estimated at \$100,000, to be carried by each agency in proportion to their land ownership. Ownership was based upon the timbered area threatened, and not the infested units. Private funds were used to initiate this project.

Field activities in connection with this operation started on May 18, and were completed on July 9. As July is too late to obtain effective results from control, an effort will be made to complete all future projects by June 30. During this operation, now known as the Thompson River Bark Beetle Control Project, 19,420 trees were treated on an area of 22,525 acres. The reduced acreage from the original estimate resulted from the elimination of some large units where the infestation was so light that control was not warranted. The Coeur d'Alene Laboratory provided a continuous technical service throughout the duration of this project.

During August and September a thorough post control survey was made of the entire Thompson River drainage and adjacent areas. Prior to the institution

of ground work, all timbered areas adjacent to known areas of infestation were covered by an aerial reconnaissance. This was not just a "fly over", but a thorough "look see" from relatively low elevations. Although an aerial survey will only show red tops (trees attacked the previous season) all serious situations are revealed. Aerial surveys will miss the current attacks of the mountain pine beetle, however such infestations are seldom of such seriousness, that the situation can not be recovered by control the following season. However we recognize the limitations as well as the values of aerial bark beetle surveys. During this post control survey a total of 271,000 acres were covered by a 4.03 percent strip survey. A total of 353 effective (strip runners) man day were used to complete this project at a cost of \$0.03 per acre.

Results obtained from this survey showed a total of 41,000 infested trees on some 44,100 acres. There is a logical explanation for the infestation that is now heavier than at the time control was instituted. The 1949 control operation was directed against a rapidly increasing beetle outbreak. Under such conditions the beetle brood that emerges from one tree is capable of attacking and killing 4 or 5 others. Trees with such an increased potential, that are missed or improperly treated, will rebuild an infestation back to its previous or more serious status in a relatively short time. Under the adverse operating conditions of the 1949 project, it can be expected that many trees were missed, and that perhaps there were a few areas that were overlooked entirely. Recognizing the increased potential of a rapidly increasing mountain pine beetle infestation in lodgepole pine, one can be assured that the 1949 control operation was far from the failure that the increased infestation may cause it to appear. One can be further assured that had there been no control there would have been several times as many infested trees as are now present in the area.

CUSTER NATIONAL FOREST CONTROL PROJECT BLACK HILLS BEETLE - PONDEROSA PINE

In 1947 an extensive examination was made of a few ponderosa pine trees that had been attacked by the Black Hills beetle on the Long Pine Division of the Custer National Forest, South Dakota. At that time the condition was not serious, but a more intensive survey was planned for the following season. The 1948 survey revealed an infestation of sufficient seriousness to warrant recommendations for control in the spring of 1949. This work was done between June 21 and July 10, and although a little late for best results, a total of 841 infested trees were treated.

During September a 5% post control survey was made of the entire Long Pine Division, which involved some 15,000 acres. This work was accomplished with 48 effective man days at a cost of \$.04 per acre. The only 1949 infestation recorded was in the one unit where control was conducted in the spring on which a 7.5% survey was made. In this unit there was a 1949 infestation of .044 of an infested tree per acre, or a total of 146 trees. The treatment of these trees has been recommended.

TARGHEE-TETON CONTROL PROJECT
IDAHO AND WYOMING
MOUNTAIN PINE BEETLE - LODGEPOLE PINE

The history of the Targhee-Teton project has been told in previous reports. Control measures conducted in 1949 marked the third year of the Targhee-Teton bark beetle control project. In 1948 a total of 114,000 infested lodgepole pine trees were treated on units within the Targhee-Teton, Caribou, and Wyoming National Forests. A survey in September of that year showed that on the areas treated the infestation had been reduced by 75 percent, from 114,000 to 28,000 trees. However the addition of the entire Caribou National Forest to the 1949 plan of control increased the total number of trees to be treated, from 28,000 to 67,000. Plans for spring control in 1949 were pointed to a complete cleanup of all infested trees. It was hoped that the fulfillment of this plan would leave only a small amount of maintenance control for 1950. Unfortunately it was not possible to complete this plan and only 17,918 trees were treated.

During last August and September a total of 489,000 acres were covered by an intensive survey. On known areas of infestation a 5% survey was planned, where conditions were unknown a light coverage was made, and increased to 5 or 6 percent whenever conditions warranted. Control measures have been recommended for the treatment of some 41,300 trees, on areas totaling 240,423 acres.

PAYETTE NATIONAL FOREST CONTROL PROJECT
ENGELMANN SPRUCE BEETLE - ENGELMANN SPRUCE

Serious infestations of the Engelmann Spruce Beetles were reported on several areas within the Payette National Forest, Idaho in 1947. These areas were examined, but a detailed survey was not made until 1948. Data obtained from this survey indicated some 4,580 Engelmann Spruce units (trees, windfalls, broken tops, and stubs) as being infested with the Engelmann Spruce beetle and requiring treatment. Control was recommended and the work planned for August and September 1949. Control measures were carried through and some 4000 units treated. As this work continued late into the fall, a large percent of 1949 attacks were treated. A resurvey of some areas was made in October to permit further treatment this fall wherever necessary. These units will be resurveyed in 1950 after the current attacks have occurred.

FOREST INSECT DETECTION SURVEY PROGRAM

Detection surveys are directed to areas where the status of forest insect conditions is not known. Areas selected for these surveys are those where previous examinations have indicated the presence of potentially dangerous insect situations, or where some abnormal forest condition has been reported. In some instances they are directed to timbered areas where there is no information as to the status of insect conditions available. Unfortunately

the past seasons program could not include all areas where such detection surveys should have been conducted. It is hoped that during the 1950 season a larger program can be conducted, and that in a few years we will have information as to the status of insect conditions throughout the region. Preliminary or detection surveys will vary in character with the different problems to be met. In some instances an aerial, or extensive ground coverage is sufficient. However with other situations it is necessary to obtain a small amount of data. Such coverages will vary from 1 1/4 to 2 1/2 percent. When a light coverage indicates a potentially serious situation additional data are obtained. It is considered that a sample of at least 5% of an infested area is necessary for the planning of control.

Beaverhead National Forest, Montana

The Beaverhead National Forest lies to the immediate north of the Targhee Teton bark beetle control project, previously described in this report. The proximity of the Beaverhead Forest to this heavily infested area gave additional weight to a report of a lodgepole pine infestation within the Jack Creek drainage. A rather thorough detection survey was planned for the southern portion of the Beaverhead, with an aerial reconnaissance being the first step. This reconnaissance disclosed scattered red topped trees in a number of drainages. Although with the exception of Jack Creek, these trees were considered as having been killed by porcupines, ground checks were considered necessary. A summary tabulation of this survey follows:

| <u>Area</u> | <u>Acres</u> | <u>Host</u> | <u>Coverage</u> | <u>1949 Infestation</u> |
|------------------|--------------------------|----------------|-----------------|-------------------------|
| | <u>Intensive Surveys</u> | | | |
| S. E. Jack Creek | 648 | Lodgepole Pine | 6.3% | None |
| S. W. Jack Creek | 2775 | Lodgepole Pine | 5.0% | 1332 |
| North Jack Creek | 5120 | Lodgepole Pine | 5.0% | 373 |

Extensive ground examinations were also made of the Bear, Indian, Cedar, Moose, South Willow, North Willow, Mill, Jourdain, Sloan Caw Camp, and Centennial Valley drainages. These ten areas comprised some 37,877 acres, and were those in which red topped trees had been recorded by the aerial survey. The mapping of these red tops from the air was found to be rather accurate, and in all instances the suspicions of porcupine kills was sustained. In addition to this work in the southern portion of the forest two examinations were made of a large lodgepole pine, Engelmann spruce blowdown near the Elkhorn Hot Springs.

The only serious infestation recorded by this survey was the situation previously reported from the Jack Creek Drainage. The data obtained showed that during the past year the infestation (number of trees infested) decreased approximately 80%. Because of this natural decrease in the severity of this outbreak control was not recommended. A recheck of this situation will be made in 1950 to determine if this natural reduction has continued or if control is necessary.

Cabinet National Forest, Montana

Four areas on the Cabinet National Forest were selected as warranting inclusion in the 1949 detection survey program. For three of these areas this selection was based upon the history of past mountain pine beetle infestations, and the other area upon a report of an abnormal activity of this insect.

| <u>Area</u> | <u>Acres</u> | <u>Host</u> | <u>Coverage</u> | <u>1949 Infestation</u> |
|---------------------|--------------|-------------|-----------------|-------------------------|
| 12 Mile Creek | 2000 | White Pine | 4.5% | 2 W. P. Windfalls |
| East Fork Big Creek | 1500 | White Pine | 2.8% | 2 Lodgepole Pine |
| Vermillion Creek | 5000 | White Pine | .7% | 5 W. P. Trees |
| Up Up Creek | 1000 | Lodgepole | 4.2% | 6 Lodgepole Trees |

No serious situations were disclosed by this survey. However, the need for a constant surveillance of all such areas is evident.

Clearwater National Forest, Idaho

Based on the history of past mountain pine beetle infestations detection surveys were directed into five Clearwater National Forest areas. Data obtained from these surveys are shown in the following tabulation.

| <u>Area</u> | <u>Acres</u> | <u>Host</u> | <u>Coverage</u> | <u>1949 Infestation</u> |
|----------------------------|--------------|-------------|-----------------|--|
| Orogrande | 13,400 | White Pine | 2.4% | 1940 W. P. Windfalls |
| Orogrande Windfall area | 600 | White Pine | 5.0% | 1560 W. P. Windfalls |
| Tepee Creek | 1,090 | White Pine | 2.4% | 43 W.P. Trees } 453 W.P. Windfalls } 496 |
| Dead Horse | 1,700 | White Pine | 1.6% | 119 W.P. Windfalls |
| Sheep Mountain | 3,400 | White Pine | 2.06% | 100 W.P. Trees } 1300 W.P. Windfalls } 1400 |
| Cedars Unit | 6,500 | White Pine | 1.00% | 200 W.P. Trees } 900 W.P. Windfalls } 1100 |

It is fortunate that these surveys were conducted as they disclosed serious infestations of the mountain pine beetle in white pine windfalls. Control measures have been recommended.

Coeur d'Alene National Forest, Idaho

In addition to the intensive 5 percent post control survey of the Yellow Dog-Downey Creek Units, detection surveys were made of seven additional areas. These areas were selected because they contained

valuable stands of white pine timber, and the fact that the status of insect conditions was unknown.

| <u>Area</u> | <u>Acres</u> | <u>Host</u> | <u>Coverage</u> | <u>1949 Infestation</u> |
|--------------------|--------------|-------------|-----------------|---|
| Deception Creek | 600 | White Pine | 7.3% | 180 W.P. Windfalls |
| Laverne Creek | 2560 | White Pine | 1.7% | 58 W.P. Windfalls |
| Cougar Creek | 7500 | White Pine | 2.5% | 120 W.P. Trees 1425 W.P. Windfalls) 1545 |
| Indian Creek | 600 | White Pine | 8.5% | 12 W.P. Windfalls |
| Upper Indian Creek | 200 | White Pine | 10.5% | 20 W.P. Trees 28 W.P. Windfalls) 48 |
| Barrymore Creek | 600 | White Pine | 2 % | 96 W.P. Trees 150 W.P. Windfalls) 246 |
| Shoshone Creek | 5000 | White Pine | 1.2% | 165 W.P. Windfalls |

These surveys revealed some potentially dangerous situations. As in the Yellow Dog-Downey Units most of the mountain pine beetle attacks were confined to windfalls. Control has been recommended for the Barrymore, Upper Indian, and Cougar Creek units.

Kaniksu National Forest, Idaho

Detection surveys were directed to seven areas on the Kaniksu National Forest because of white pine timber values and a lack of information concerning bark beetle conditions. These areas were rather thoroughly covered, but only light or so called normal infestations of the mountain pine beetle were recorded. The data obtained are as follows:

| <u>Area</u> | <u>Coverage</u> | <u>1949 Infestation</u> |
|------------------|-----------------|------------------------------------|
| Lightning Creek | 3.3% | One white pine windfall |
| Rapid Lightning | 3.4% | Three white pine windfalls |
| Granite Mountain | 66 A. Sample | Two standing trees One windfall |
| Big Meadows | 46 A. Sample | Three standing trees |
| Boar Paw | 47 A. Sample | None |
| Ball Creek | 40 A. Sample | One windfall |
| Stoney Creek | 60 A. Sample | Three trees |
| | | Two trees |
| | | Two lodgepole |
| | | Two W.P. windfalls |
| | | One tree |

Although only a so called normal infestation of the mountain pine beetle was found in all but one area, the potential destructiveness of such situations cannot be overlooked. Such infestations can develop into destructive out-breaks in a few years. To be prepared to take immediate

action in the event of such an occurrence, constant checks of these areas must be made.

Interest in these surveys is centered upon the Rapid Lightning Creek drainage. In 1941 a large percent of the National Forest timber in this area was sold in an attempt to check a serious mountain pine beetle infestation. This sale was based upon a partial cut, with 50 percent of the merchantable white pine, which included all trees susceptible to bark beetle attack, being removed. Prior to 1941, the losses in timber stands adjacent to and spreading into the publicly owned forests had been extremely heavy. Following this experimental partial cut, there has been practically no further damage to residual white pine stands. This area will be kept under annual observation.

Lewis and Clark National Forest, Montana

Reports of a mountain pine beetle infestation in the ponderosa pine stands of the White Sulphur Springs and Musselshell Ranger Districts of the Lewis and Clark National Forests were received in 1947. A preliminary examination was made which was followed by a more intensive survey. Data obtained indicated a rather severe 1947 infestation on an area of 9,950 acres. Control measures were recommended, but no funds were available. No further attention was given to this situation until the 1949 season, when it was considered advisable to resurvey the more heavily infested areas. The area covered and the data obtained follow:

| <u>Area</u> | <u>Acres</u> | <u>Coverage</u> | <u>1949 Infestation</u> |
|------------------|--------------|-----------------------|-------------------------|
| Whetstone | | 30 A Sample | None |
| Flagstaff | | 30 A Sample | None |
| Pasture Gulch | 2200 | 2.3% | 83 Trees |
| Baxter Gulch | 228 | 11.8% | 57 Trees |
| Spring Creek | 1400 | 3.2% | 30 Trees |
| Hopley Creek | 7500 | 2.5% | 422 Trees |
| Portion of | 880 | 5.6% | 422 Trees |
| Four Mile | | Ground Reconnaissance | None |
| Novada Creek | | 66 A Sample | None |
| Clarks Fork | | Covered Thoroughly | None |
| Southeast Castle | | Covered Thoroughly | None |
| Roberts Creek | | Covered Thoroughly | None |

Results of the survey show a marked decrease in the severity of the infestation during the past two years. Although a light infestation is still present in some areas that could again build to destructive proportions, in view of the natural decrease that has occurred no control was recommended. The infested areas will be rechecked during the coming season to determine if this condition still holds.

St. Joe National Forest, Idaho

In 1948 a few areas on this forest were covered by extensive surveys. The data obtained indicated a light mountain pine beetle infestation, which required a resurvey of several areas in 1949. The areas covered during the 1949 season were as follows:

| <u>Area</u> | <u>Acres</u> | <u>Host</u> | <u>Coverage</u> | <u>1949 Infestation</u> |
|--------------------|---|----------------|-----------------|-------------------------|
| Aspen-Entente | 1300 | Lodgepole Pine | 3.38% | 208 Trees |
| Float Creek | 600 | Lodgepole Pine | 4.0% | 720 Trees |
| Head of Gold Cr. | 200 | Lodgepole Pine | 4.0% | 200 Trees |
| Head of Quartz Cr. | 600 | Lodgepole Pine | 1 | 300 Trees |
| Bird Creek | 2000 | White Pine | 1.7% | 118 Trees |
| Bottle Creek | 900 | - - | 2.0% | None |
| Eagle Creek | 2880 | White Pine | 1.4% | 404 Trees |
| Tumbledown | 2030 | White Pine | 1.5% | 0 |
| East Fork Gold | 1935 | White Pine | 1.2% | 79 Trees |
| Allon Ridge | 800 | White Pine | 4.0% | 24 Trees |
| Sisters Basin | 1200 | White Pine | 1.9% | 51 Trees |
| Alpine Creek | 480 | - - | | 0 |
| State Line Area | - Many red top white bark pine - Blister Rust | | | |
| Quartz Creek | - Thorough reconnaissance | | | 0 |
| Gold-Bruin | - Thorough reconnaissance | | | 0 |

A number of these areas contain potentially serious infestations, but none warrant control at this time. It will be necessary to recheck some of these areas during the coming season, as the existing conditions can become serious in a short time.

Boise National Forest, Idaho

During the 1949 season forest officers reported a number of groups of beetle killed ponderosa pine within the Anderson Creek drainage. A few weeks later these same officers made an aerial reconnaissance of the general Garden Valley area to map the location of heaviest infestation. In November a two man crew was sent from this laboratory to obtain data as to the seriousness of the situation. Although a heavy snow coverage eliminated work in the back areas, it was possible to obtain data from the heavily infested portions of the drainage. The following data were obtained:

| | |
|------------------------------------|--------|
| Acres of area surveyed | 19,360 |
| Acres of Sample Strip | 484 |
| Percent covered | 2.5 |
| Attacks per acre | |
| 1st Generation Western Pine Beetle | .12 |
| 2nd Generation Western Pine Beetle | .035 |
| Ips killed trees | .12 |

The trees that were attacked by the 1st generation of this beetle and from the beetles had emerged at the time of the survey, were no doubt the red

tops observed during the aerial reconnaissance. Attacks of the 2nd Generation were green to slightly faded at the time of the ground survey and would have been difficult to see from the air even at that time. Trees killed by Ips were thought to comprise the larger groups observed from the air. Many trees top killed by Ips were recorded on the sample strips.

Although the situation recorded did not warrant the expense of control, it was recommended that a rather extensive reconnaissance be made of this general area early in the summer of 1950.

Payette National Forest, Idaho

A report of an infestation of the western pine beetle in the ponderosa pine stands of the Lost Creek Drainage, Payette National Forest, was received in August 1949. The area was examined and the situation considered as of sufficient seriousness to warrant a more intensive coverage. However, this survey showed an infestation that only averaged .09 of a tree per acre which did not warrant control. This area should be re-checked during the coming season.

Helena, Gallatin and Deerlodge National Forests, Montana

Although it has been known for years that large forested areas on the Helena, Gallatin, and Deerlodge National Forests were heavily infested with the spruce budworm, the extent and seriousness of the damage that had occurred was not fully known. To obtain this information a thorough extensive examination was made of these three forests, although there are many other areas in the region where the infestation is equally as severe. The following data were obtained.

(See Table on Page 12)

On the basis of this information recommendations were made for the treatment of 135,000 acres as a start in checking further damage that will no doubt occur.

Craigmont - Grangeville Area of Idaho

It has been known for some time that the spruce budworm was present within the Idaho forests adjacent to the infested areas of northeastern Oregon. In 1949 an infestation was reported from the territory immediately south of Lewiston, Idaho. In view of the plans for controlling the northeastern Oregon epidemic of this insect, an attempt was made to establish the location and seriousness of the western Idaho infestations. This extensive reconnaissance revealed budworm defoliation of varying degree of severity, in 81 sections located in nine separate Townships. In none of these areas was the damage as severe as that encountered further east in Montana.

Approximate net Douglas fir forest acreage infested by spruce budworm by degree of damage, on Helena, Gallatin, and Deerlodge National Forests, Montana in 1949.

| FOREST* | AREA | DEGREE OF DAMAGE | | | | | TOTAL |
|-----------|----------------------|------------------|---------|--------|------------|--|---------|
| | | LIGHT | MEDIUM | HEAVY | VERY HEAVY | | |
| Helena | Marysville- | | | | | | |
| | Edward Mtn. | 10,000 | 20,000 | 4,000 | | | 34,000 |
| | Canyon Creek | 5,000 | 10,000 | | | | 15,000 |
| | Greenhorn Mtn. | 2,000 | 3,000 | | | | 5,000 |
| | Beaver-Soup Crs. | 37,000 | 5,000 | | | | 42,000 |
| | Trout Creek | 12,000 | 17,000 | | | | 29,000 |
| | Magpie Creek | 4,000 | 20,000 | | | | 24,000 |
| | Avalanche Creek | | 4,000 | 9,000 | 4,000 | | 17,000 |
| | White Gulch | | | 4,000 | 5,000 | | 9,000 |
| | Confederate Gulch | | 3,000 | 4,000 | | | 7,000 |
| | Duck-Bay Creeks | 4,000 | 4,000 | 1,000 | | | 9,000 |
| | Deep Creek | 8,000 | 6,000 | | | | 14,000 |
| | Dry Creek | 7,000 | 4,000 | | | | 11,000 |
| | Birch Creek | 1,000 | | | | | 1,000 |
| | 16-Mile Creek | 23,000 | | | | | 23,000 |
| | Camas Creek | 1,000 | | | | | 1,000 |
| | Rock Creek | 4,000 | | | | | 4,000 |
| | Dry Range | 7,000 | 8,000 | | | | 15,000 |
| | Antelope Creek | | 4,000 | | | | 4,000 |
| | Keep Cool - Elk Crs. | | 5,000 | | | | 5,000 |
| | Faulkner Creek | 1,000 | 1,000 | | | | 2,000 |
| | Benton-Vermont | | | | | | |
| | Gulches | | | 7,000 | | | 7,000 |
| | Lump Gulch | 2,000 | 1,000 | | | | 3,000 |
| | Glancy Creek | 1,000 | 4,000 | | | | 5,000 |
| | Comet Creek | | 3,000 | | | | 3,000 |
| | Warm Springs Cr. | 1,000 | | | | | 1,000 |
| | Sub Totals | 130,000 | 122,000 | 29,000 | 9,000 | | 290,000 |
| Gallatin | Bridger Creek | 5,000 | 8,000 | 2,000 | | | 15,000 |
| | Jackson Creek | 1,000 | 2,000 | 1,000 | | | 4,000 |
| | Battle Ridge | 2,000 | 1,000 | | | | 3,000 |
| | 6-Mile Creek | 1,000 | 1,000 | 2,000 | | | 4,000 |
| | Sub-Total | 9,000 | 12,000 | 5,000 | | | 26,000 |
| Deerlodge | Whitetail Creek | 10,000 | 15,000 | 15,000 | | | 40,000 |
| | Boulder River | 20,000 | 30,000 | | | | 50,000 |
| | Sub-Totals | 30,000 | 45,000 | 15,000 | | | 90,000 |
| TOTALS | | 169,000 | 179,000 | 49,000 | 9,000 | | 406,000 |

* Includes adjacent privately-owned timberlands.

STATISTICAL SUMMARY OF 1949
Bark Beetle Survey Program

FOREST

| | Acres | % of Survey | Effective Man-Days | Non-eff. Man-Days | Acres Per Man-Days* | Cost Per Acre** | Acres | Effective Man-Days | Non-eff. Man-Days | Acres Per Man-Day* | Cost Per Acre |
|------------------|-----------|-------------|--------------------|-------------------|---------------------|-----------------|---------|--------------------|-------------------|--------------------|---------------|
| Beaverhead | 8,543 | 5.0 | 33 | 20 | 259 | 0.07 | 37,877 | 23 | 14 | 1647 | 0.01 |
| Boise | 19,360 | 2.5 | 18 | 11 | 1676 | .03 | | | | | |
| Cabinet - Spring | 60,674 | 5.8 | 92 | 81 | 658 | .034 | 189,326 | 15 | 0 | 12621 | .001 |
| Fall | 280,500 | 4.03 | 353 | 215 | 795 | 0.03 | 60,000 | 8 | 5 | 7500 | 0.006 |
| Clearwater | 26,690 | 2.4 | 22 | 14 | 1215 | 0.02 | | | | | |
| Coeur d'Alene | 17,060 | 4.8 | 24 | 15 | 711 | 0.03 | | | | | |
| Custer | 15,450 | 5.0 | 48 | 30 | 322 | 0.04 | 34,095 | 6 | 4 | 5682 | 0.003 |
| Kaniksu | 19,400 | 3.04 | 30 | 19 | 647 | 0.04 | | | | | |
| Kootenai | 56,630 | 4.9 | 100 | 61 | 566 | 0.06 | | | | | |
| Lewis & Clark | 16,364 | 2.5 | 18 | 11 | 909 | 0.02 | 5,120 | 6 | 4 | 853 | 0.02 |
| Payette | 13,130 | 3.18 | 16 | 10 | 821 | 0.04 | | | | | |
| St. Joe | 16,425 | 2.4 | 26 | 16 | 632 | 0.04 | 13,100 | 4 | 2 | 3275 | 0.007 |
| Targhee-Teton | 489,063 | 2.7 | 537 | 320 | 910 | 0.03 | | | | | |
| | 1,039,289 | | 1317 | 823 | | | 340,341 | 62 | 29 | | |

Effective Man-Day - 1379

Non-Effective Man-Day - 852

Total Man-Day - 2231

* Based on effective man-days (Actual strip coverage)

** Based on total cost.

Statistical Summary of 1949 Spruce Budworm Survey Program

Helena, Gallatin and Deerlodge National Forests

| | |
|---------------------------|---------|
| Areas Covered | |
| Helena | 290,000 |
| Gallatin | 26,000 |
| Deerlodge | 90,000 |
| Total | 406,000 |
| Man Days (Field & Office) | 37 |
| Cost per acre | \$0.003 |
| Per man day | 31.35 |

Western Idaho

| | |
|-------------------------|---------|
| Acreage covered | 25,000 |
| Man days Field & Office | 24 |
| Cost per acre | \$0.029 |
| Per man day | 30.08 |

The difference in the cost of these two projects came from the two types of infestations being surveyed. In Montana there were large areas of infestation, while the Idaho infestation was in small scattered areas of timber.

COOPERATING AGENCIES

The Federal, State, and private agencies who gave assistance to the Coeur d'Alene Laboratory in the preformance of its assigned duties are shown in the following list. Special acknowledgement is more than due the Forest Officers of Forest Service Regions One and Four. By assigning personnel to our survey projects, by administrating post control survey funds, as well as many other services to our personnel an assistance was given which enabled us to meet our responsibilities. We are also greatly indebted to the Office of Blister Rust Control, Bureau of Entomology and Plant Quarantine, Spokane, Washington. A serious transportation problem that faced our survey organization was solved by this office through the loan of three pick-up trucks. This special cooperation by these two units is greatly appreciated.

Federal

Forest Service

National Forest Regions 1 and 4, Missoula, Montana and
Ogden, Utah

Northern Rocky Mountain Forest and Range Experiment
Station, Missoula, Montana

Park Service

Glacier, Yellowstone, and Grand Teton National Parks
Montana, Idaho, and Wyoming

Indian Service

Crow, Tongue, Blackfeet, Coeur d'Alene, and Lapwai
Reservations, Montana and Idaho

Bureau of Entomology and Plant Quarantine

Division of Plant Disease Control,
Blister Rust Control, Spokane, Washington

Bureau of Plant Industry, Soils, and Agricultural Engineering

Division of Forest Pathology, Missoula, Montana

State

Montana State Forester, Montana
Idaho State Forester, Boise
Montana State University, Missoula
Montana State College, Bozeman
University of Idaho, Moscow
The State College of Washington, Pullman

Private Agencies

North Idaho Forestry Association
Western Forestry and Conservation Association, Portland, Oregon
Western Pine Association, Portland

Private Agencies cont.

Clearwater Timber Protective Association, Lewiston, Idaho
Potlatch Timber Protective Association, Potlatch, Idaho
Pend O'Reille Timber Protective Association, Priest River, Idaho
Potlatch Forest Industries, Inc., Lewiston, Idaho
J. Neils Lumber Company, Libby, Montana
Lumber Division, Anaconda Copper Mining Company, Bonner, Montana
Northern Pacific Land Company, Seattle, Washington
Milwaukee Land Company, St. Paul, Minnesota

PERSONNEL - CALENDAR YEAR 1949
Forest Insect Pest Funds

Permanent Employees

| Name | Title | Time allocated to project |
|-------------------|--------------------------|---------------------------|
| James C. Evenden | Entomologist, GS-13 | Half Time |
| Tom T. Terrell | Entomologist, GS-9 | Full Time |
| Archie L. Gibson | Entomologist, GS-11 | Part Time |
| Philip C. Johnson | Entomologist, GS-11 | Part Time |
| Violet L. Barber | Clerk-Stenographer, GS-4 | Half Time |

Temporary Employees

| Name | Period of Employment | Status |
|---------------------|----------------------|---------------------------|
| Henry G. Rust | 10/1 - 12/31 - 49 | Former For. Ser. Employee |
| Galen C. Trostle | 9/1 - 10/31 - 49 | Forestry Graduate |
| Charles J. Johnson | 8/1 - 10/28 - 49 | Forestry Graduate |
| Claire E. Letson | 8/1 - 9/30 - 49 | Forestry Student |
| David S. Klehm | 8/1 - 9/30 - 49 | Forestry Student |
| Glen D. Fulcher | 8/1 - 9/30 - 49 | Forestry Student |
| Burton W. Holt | 8/1 - 9/30 - 49 | Forestry Student |
| Harold C. Hunter | 8/1 - 9/30 - 49 | Forestry Student |
| James H. Kuechmann | 8/1 - 9/30 - 49 | Forestry Student |
| Raymond L. Miller | 8/1 - 9/30 - 49 | Forestry Student |
| Charles F. Cesar | 8/4 - 9/30 - 49 | Forestry Student |
| Robert L. Perry | 8/8 - 8/10 - 49 | A.C.M. Forester |
| Harvey R. Hotsel | 8/8 - 9/30 - 49 | Temp. For. Ser. Employee |
| Fred D. White | 8/9 - 8/10 - 49 | Laborer |
| Aleck W. Gurnsey | 8/11 - 9/21 - 49 | College Student |
| Jim S. Bowman | 9/1 - 9/16 - 49 | Forestry Student |
| Richard R. Cordell | 9/6 - 10/27 - 49 | Laborer |
| Veril E. Peck | 9/9 - 10/27 - 49 | Laborer |
| Albert L. Baier | 9/8 - 10/19 - 49 | Laborer |
| Chester T. Balaban | 10/3 - 10/8 - 49 | Temp. B.R.C. Employee |
| Presley D. Brinegar | 10/3 - 10/8 - 49 | Temp. B.R.C. Employee |
| Clyde L. Doyle | 10/3 - 10/14 - 49 | Temp. B.R.C. Employee |
| Raymond W. Karr | 10/3 - 10/14 - 49 | Temp. B.R.C. Employee |
| Alvin R. Ruddick | 10/3 - 10/14 - 49 | Temp. B.R.C. Employee |
| Joseph Alonzo | 10/2 - 10/28 - 49 | Temp. B.R.C. Employee |
| Paul Evans | 10/2 - 10/28 - 49 | For. Ser. Employee |
| William Hulch | 10/17 - 10/28 - 49 | For. Ser. P-2 |
| John Lyman | 10/17 - 10/28 - 49 | For. Ser. SP-5 |

Temporary Employees Cont.

| | | |
|-------------------|--------------------|----------------------|
| James Mutzon | 10/17 - 10/28 - 49 | For. Ser. SP-5 |
| Blaine Butler | 8/8 - 10/28 - 49 | Temp. F. S. Employee |
| Henry Thompson | 8/8 - 11/18 - 49 | Temp. F. S. Employee |
| Earl D. Waken | 8/8 - 9/10 - 49 | Laborer |
| Vearl D. Weeks | 8/8 - 9/10 - 49 | Laborer |
| Arlo J. Moffat | 8/8 - 9/10 - 49 | Laborer |
| Laren A. Keing | 8/8 - 9/10 - 49 | Laborer |
| Cleon B. Kunz | 8/8 - 9/10 - 49 | Laborer |
| Robert D. Murri | 8/10 - 9/17 - 49 | Laborer |
| Arlin D. Knight | 8/8 - 9/10 - 49 | Laborer |
| Gordon D. Garner | 8/8 - 9/10 - 49 | Laborer |
| Nile H. Miner | 8/8 - 9/10 - 49 | Laborer |
| Gerald Bayley | 8/8 - 9/20 - 49 | Laborer |
| Huel R. Jones | 8/10 - 9/20 - 49 | Laborer |
| Walter Sorenson | 8/10 - 9/20 - 49 | Laborer |
| Keith L. Johnson | 8/15 - 9/20 - 49 | Laborer |
| Glen Smith | 8/15 - 9/17 - 49 | Laborer |
| Ellis R. Potter | 8/10 - 9/20 - 49 | Cook |
| Carl M. Lewis | 8/10 - 9/20 - 49 | Laborer |
| Otto L. Sandin | 8/10 - 9/14 - 49 | Laborer |
| Dale L. Tanner | 8/10 - 9/20 - 49 | Laborer |
| Dale Larson | 8/15 - 9/17 - 49 | Laborer |
| Maline Beardal | 8/10 - 9/6 - 49 | Laborer |
| R. C. Murphy | 8/10 - 9/14 - 49 | Laborer |
| R. Moore | 8/10 - 9/14 - 49 | Laborer |
| Vernon L. Bresler | 8/10 - 9/14 - 49 | Park Ser. Employee |

Combination Bark Beetle and Timber Survey

| | | |
|-------------------|------------------|------------------------|
| Robert Brown | 8/12 - 9/30 - 49 | For. Ser. Employee P-1 |
| John Herron | 8/12 - 9/30 - 49 | For. Ser. Employee P-1 |
| Warren Streeter | 8/12 - 9/30 - 49 | Laborer |
| George McLaughlin | 8/12 - 9/30 - 49 | Laborer |

REPORTS SUBMITTED OF SURVEYS CONDUCTED IN 1949

James C. Evenden

Forest Insect Detection Survey
Beaverhead National Forest

October 27, 1949

Forest Insect Detection Survey
Cabinet National Forest

November 1, 1949

Forest Insect Detection Survey
Clearwater National Forest

September 8, 1949

Forest Insect Detection Survey
Coeur d'Alene National Forest

October 31, 1949

Forest Insect Detection Survey
Custer National Forest

October 27, 1949

Forest Insect Detection Survey
Kaniksu National Forest

November 2, 1949

Forest Insect Detection Survey
Lewis and Clark National Forest

November 1, 1949

Forest Insect Detection Survey
St. Joe National Forest

October 31, 1949

Tom T. Terrell

Thompson River Project
Cabinet National Forest

October 27, 1949

Forest Insect Survey
Payette National Forest

November 10, 1949

Targhee-Teton Survey Report

October 27, 1949

Philip C. Johnson

Spruce Budworm Detection Survey

Helena, Gallatin & Deerlodge National Forests

November 2, 1949

Archie L. Gibson

Forest Defoliators
Western Idaho

November 2, 1949

Henry G. Rust

Insect Survey
Kootenai National Forest

November 1, 1949

H. C. Roffler - Forest Service

Forest Insect Survey
Coeur d'Alene National Forest

November 2, 1949

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